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ABSTRACT

This study examined whether students perform better academically if they are in a multi-ethnic school setting, in the minority in a predominantly single-ethnic school, or in the majority at a predominantly single-ethnic school. The study looked at three ethnic/racial groups: White, Black, and Hispanic; and analyzed urban students' mathematics and reading test scores from the fourth through eighth grade. An analysis of variance was used to assess group differences and compare groups of the same ethnicity who were in different school settings. Data from the state education agency's database for students from 1986-87 through 1990-91 from their fourth through eighth grade years were used. Student ethnicity, gender, age, socioeconomic status, and standardized test scores were evaluated. The results suggest that it may be more academically beneficial to minority students for school districts to emphasize desegregating schools rather than promoting single-race schools. In particular, the study shows that the achievement of Black and Hispanic students is positively affected by the presence of a higher percentage of White students in the school. However, White students are adversely affected by being in schools that are predominantly Black or Hispanic. Includes 36 tables and 17 references. (JB)

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Comparison of Student Academic Performance at Multi-Ethnic Schools Versus Single-Ethnic Schools

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Comparison of Student Academic Performance at Multi-Ethnic Schools Versus Single-Ethnic Schools

Introduction

With the 1954 U.S. Supreme Court decision in *Brown v. Board of Education*, 347 U.S. 483, desegregation became law. However, almost forty years later, there remain discrepancies between ethnic groups on academic performance. One assumes that desegregation is about improving the academic achievement of minority students. Addressing the concerns of minority children who are isolated in our nation's inner cities will require us to place an equal emphasis on effective schooling regardless of whether or not a school is physically desegregated. The purpose of this study is to determine if students, in general, perform better academically if they are in a multi-ethnic school setting, if they are in the minority at a predominantly single-ethnic school, or if they are in the majority at a predominantly single-ethnic school. For purposes of this study, ethnicity will refer to the following three ethnic/racial groups: White, Black, and Hispanic. This study analyzed students' mathematics and reading test scores from fourth through eighth grade. Students were from urban schools in the southwest.

Perhaps it will be beneficial to explain what brought us to this topic, which in turn will also explain our perspective. The first reason for this study was the evidence of academic differences between ethnic groups. One can certainly make a case that there is a preoccupation with ethnic and racial issues in education literature. There are, or have been, a number of publications devoted entirely to the topic (e.g., Equity and Excellence, The Journal of Non-White Concerns, etc.). However, it seems that such issues should be separated from the primary concern of the educational system: educating people. One's racial or ethnic background seems irrelevant. Nevertheless, a brief look at academic achievement, on either a local or a national scale, indicates differences between ethnic/racial groups. Therefore, we are led to searching for the underlying reasons for such differences, and hopefully to discover some solutions.

The second reason for this investigation was the local and national publicity of single-ethnic schools. To find and correct the reasons for the academic differences between ethnic groups, some have proposed that single-ethnic schools may provide the solution because children will have a social identity stemming from role models within such schools. On the district level, a school for a particular ethnic minority is often promoted by the community leaders within that particular ethnic minority. This appears odd for those who may understand this as a rejection of the 1960s' gains in civil rights by the very groups who made such gains.

The question to answer is: "Is there evidence that academic differences between ethnic groups can be eliminated (i.e., the improvement of all three groups' achievement) by segregating the school settings of the groups?" We know that there are differences in academic achievement between ethnic groups, and that there are differences between school types. However, this study was conducted to determine how students of an ethnic group from one school type compare to students of that same ethnic group from other school types. For example, White students' scores at a school with a predominantly White enrollment will be compared to those of White students at: (1) a predominantly Black school, (2) a predominantly Hispanic school, and (3) an ethnically mixed school. Likewise, Black students will be compared to other Black students, and Hispanic students with other Hispanic students.

Literature Review

School Desegregation

Since it became law in 1954, numerous studies have been conducted on various aspects of desegregation and countless opinion papers have been written discussing the effectiveness of desegregation and the extent to which equality has been achieved. In chronicling the steps of desegregation, Bates (1990) stated that there are three generations of desegregation issues. First-generation desegregation allocates children to schools in order to do away with racially isolated school buildings. Second-generation desegregation removes barriers to access to programs within schools. Third-generation desegregation offers the achievement of equal learning opportunities and outcomes for all students. According to Bates, "In many large urban school districts where

desegregation is floundering, greater emphasis is being placed on effective education, regardless of whether or not the original desegregation plans included provisions for school improvement" (p. 16). "Moreover, in places in which physical desegregation plans seem to be working to some degree, we still must confront...the third-generation issue of the achievement gap between minority students and White students" (p. 11). Although it is this third-generation issue of student performance that this study addresses, the physical separation of students within ethnic groups is also of concern.

Hess & Warden (1988) conducted a study of Chicago's desegregation plan which was implemented in 1980. The plan indicated that it was valuable for minority students to attend schools with between 15 percent and 30 percent White students. However, in 1985–86, "76.6 percent of all minority students continued to attend segregated schools. Of that number, 42.7 percent attended racially isolated schools in which there were no White students" (p. 539). Thus, few additional minority students found their way into desegregated schools during the six years under consideration.

Rumberger and Willms (1992) found much segregation between racial and ethnic groups in California and much variation in the degree of segregation between districts in the state. Additionally, they found that this segregation was positively correlated to academic achievement differences in some cases but not in others.

Why should anyone, including those not in education, concern themselves with the current levels of student academic achievement of all ethnic groups? According to Pallas, Natriello, and McDill (1989), the educationally disadvantaged will comprise almost 50% of the U.S. population by the year 2020. By their definition, minority racial/ethnic group identity is a key indicator associated with being educationally disadvantaged.

School Desegregation and Student Achievement

In 1966, the results of the Equality of Educational Opportunity Survey (EEOS) conducted by Coleman, Campbell, Hobson, McPartland, Mood, Weinfeld, and York (1966) were published in a report (EEOR) from the U.S. Office of Education. This study, which was much larger and

more influential than any previous (or subsequent) study, was a response to a requirement of the Civil Rights Act of 1964 to investigate the extent of inequality in the nation's schools. The study involved surveying and testing six hundred thousand students in some three thousand schools across the country (Hanushek, 1989). The EEOR indicated that differences in existing school inputs or resources, i.e., per pupil expenditures, teacher salaries, books in the library, and a host of other facilities and curricular measures, made relatively small differences in school outputs, i.e., student achievement (Coleman, 1975; Hanushek, 1989; Levine & Bane, 1975; Mosteller & Moynihan, 1972). The one school characteristic that showed a consistent relationship to test performance was the socio-demographic characteristic of other students in the school (Hanushek, 1989; Jencks, 1972). "Attributes of other students account for far more variation in the achievement of minority group children than do any attributes of school facilities and slightly more than do attributes of staff" (Coleman et al., 1966, p. 302). The higher the socioeconomic status of the other students, the higher any given student's achievement.

Even though the Coleman study was published in 1966, more recent studies have found similar results. Under-achievement due to segregation can occur because the schools with higher minority enrollments may receive a poorer quality of education or because of a school's contextual effects such as peer groups, competition, or the social climate at a school (Rumberger & Willms, 1992). Hess and Warden (1988) compared the achievement levels of students in segregated schools versus desegregated schools. Over six years time, there was a small closing of the achievement gap between desegregated and segregated schools at the elementary level; however, the median reading scores remained higher at the desegregated, magnet schools.

This current project studies a slightly different aspect of desegregation. Instead of comparing mean scores at segregated schools to desegregated schools, we wanted to see how students of the same ethnicity in different school settings compare to each other. In doing so, it duplicates previous studies. St. John (1981) reported that the U.S. Commission on Civil Rights reanalyzed the original data from the study by Coleman et al. (1966) and found that Blacks had higher scores when they were in classrooms with a larger percent of White students. Summers

and Wolfe's 1977 study found that the more integrated the school, the higher the achievement for students of different ethnic groups. Another study also found that the higher the percent of minority students in a school, the lower the mathematics achievement (Haycock & Navarro, 1988, cited in Rumberger & Willms, 1992, p. 380). However, a study by Winkler (1975) showed that Black students performed lower after moving to a middle school which had a lower percent of Blacks than did their elementary school.

Lee and Bryk (1989) also found that the higher percent of minority students, the lower the achievement. However, they stated that academic outcomes are associated to an array of variables that, when combined, influence achievement. Still, when controlling for such variables, achievement is related to percent of ethnicity within a school. Some of these studies also noted two other variables which influence achievement and which tend to be positively correlated to the percent of ethnicity in a school: (1) The higher the mean score of a school, the higher the mean score of the minority population in that school. And (2) the higher the socioeconomic status, the higher the mean score for all ethnic groups. This latter finding further supports the results of the EEOR.

It has been reported that "[a]lthough the achievement gap between minorities and Whites has improved over the last decade, a sizable gap still remains" (Rumberger & Willms, 1992, p. 377). This is contrary to the findings of a recent NAEP data analysis which indicated a widening gap. The lead article of the January 20th Education Week began, "Student performance in mathematics improved significantly between 1990 and 1992, data from the National Assessment of Educational Progress show" (Rothman, 1993). The National Center for Educational Statistics reported that, for the 26,000 4th, 8th, and 12th graders, mathematics scores rose on average a total of five points on a 500 point scale. While much of the discussion in the article and among those in mathematics education concerns this improvement and possible reasons for it (e.g., the National Council of Teachers of Mathematics Standards and the particulars of the tests), it is interesting to note some other points regarding this report. The patterns between the age groups, ethnic groups, socioeconomic (SES) groups, genders, and school types remain the same as in past test results.

Although all of these groups increased their scores on average, the gains were not uniform and the gap between high achievers and low achievers in all of these groups widened. For example, White and Asian students continued to score higher than Blacks and Hispanics. Although there was no difference at eighth grade, boys scored higher than girls otherwise. Students at Catholic and other private schools out-performed their public school counterparts. Low SES groups scored lower than high SES groups. So while, overall, scores increased, the same patterns of mathematics achievement continued as before, and the gap between groups widened.

Methods

As Bryk and Raudenbush (1989) noted, the primary interest of education research is learning, which we can also refer to as "the growth in knowledge and skill of individual students"(p. 150). As such, we are also interested in the factors which influence learning, namely, the demographic characteristics of the students and the environmental characteristics (i.e., organizational setting). Interactions between academic growth, student characteristics, and school settings are of prime importance in such research.

Two problems inherent to the research are (1) measuring change (i.e., student growth), and (2) assessing multilevel effects (such as the student characteristics and school/classroom setting mentioned above). Recently, the long-practiced measurement of student achievement at a single time point (or often, at two points) has been questioned. Some believe that the main concern should be, "How does one change over time?" Also, the assumptions of many of the statistical techniques include random samples. However, in actual practice, students are often nested within schools and classrooms, which in turn, influences the outcomes of the studies.

To look at achievement and the effects of school setting (i.e., percent of ethnicity) on achievement, this study used an analysis of variance to look at group differences. Although a multilevel model, as used and promoted by Bryk and Raudenbush, was not used here, it may well be the next step in this study. At this point, the selection of schools has helped to factor out certain school effects. Additionally, any qualitative study into variables regarding the schools such as

family support or neighborhood role models is not included here and may be part of the next step in this study. In effect, this statistical analysis of academic achievement and percent of ethnic enrollment was intended to simply be regressions looking at the relationship of these two variables for the practical reason of determining a district policy. This is certainly a study of segregation, but to emphasize the different view of this study once more: instead of comparing ethnic groups to each other, we compared groups of the same ethnicity who were in different school settings, and that difference was based on the percent of ethnic enrollment within the schools.

Data

Data were obtained from the state education agency's database for students from 1986–87 through 1990–91 for students beginning with their fourth grade year in 1986–87 through to their eighth grade year in 1990–91. Included in these data were student ethnicity, gender, age, socioeconomic status (based on eligibility for free/reduced lunch), and standardized test scores. Also available were data on schools regarding variables such as dollars spent per student, number of compensatory education programs, student:teacher ratio, teacher ethnicity, and ethnic composition of student body. As the initial interest in this project was to determine if students of the same ethnic background in different school settings achieved at different levels, some of these variables were either equated or negated in the selection process or will become part of the next step in the study.

Instrument

The test used to measure achievement was the Metropolitan Achievement Test-6th Edition (MAT-6). The MAT-6 is a norm-referenced test developed by The Psychological Corporation to measure the achievement of students in the major skill and content areas of the school curriculum. Depending on the content of the test, MAT-6 covers grade levels from kindergarten through 12th grade. Validity and reliability of the test are available from the publisher. Normal curve equivalent (NCE) scores were used in the analyses.

Procedures

The primary selection of schools was based on percent of ethnicity. Elementary schools which have 75% or over of one ethnic/racial group were considered a one-group majority school. Because of the limited number of majority White schools, the selection criteria was reduced to at least 64% White enrollment to add one more majority White school. Others will be considered multi-ethnic schools. This did not include magnet schools as their enrollments were chosen on the basis of academic standing and ethnicity. Although there were many schools available which were 100% Black or 100% Hispanic, they were not chosen as a certain percentage of minority students were needed from each school. Because of small sample sizes, American Indians, Asians, and other ethnic groups were not included in the study. The middle schools were selected on the criteria that first, elementary students in the sample were promoted to them and second, using the same criteria as mentioned above.

The decision was made to track students' academic performance through elementary school (first though fifth grade) and middle school (sixth through eighth grade). The intent was to match elementary and middle schools on the percent of ethnicity and to follow students who continue in the same type of school. However, the MAT-6 test, which was administered in the spring, was only used from 1987 through 1991. This limited the analysis to students who began the fourth grade in 1986–87. Data were then collected for these students through their eighth grade school year (1990–91). The students were divided into groups based on their ethnicity and the ethnic composition of their school. Table 1 is provided for clarification.

Table 1.
Groups for Analysis

Schools	Students: Black	Students: Hispanic	Students: White
Majority Black	*Majority*	Minority	Minority
Majority Hispanic	Minority	*Majority*	Minority
Majority White	Minority	Minority	*Majority*
Mixed	One third	One third	One third

Analysis

Descriptive statistics on school demographics are reported as are the demographics on the samples. An analysis of variance (ANOVA) was used to analyze group differences. Analysis on each ethnic group, grade level, and MAT-6 subtest was conducted separately. Some smaller cell sizes were not included in the analysis. One limitation of this study is that none of the elementary students continued into majority White middle schools.

Results

School Demographics

In order to better understand the sample of students used, Tables 2 through 4 illustrate the demographic and academic characteristics of the schools from which the samples were drawn. It is interesting to note that at the predominantly Black schools, especially at the middle school level, a majority of the teachers were Black. For the rest of the schools, the ethnicity of the teachers was fairly evenly dispersed between Black and White.

Table 2.
Students and Teacher Ethnicity for the Schools Used in the Sample

	Student Ethnicity				Teacher Ethnicity			
Elementary	% Black	% Hispanic	% White	% Other	% Black	% Hispanic	% White	% Other
1986–87								
White	NA	NA	NA	NA	NA	NA	NA	NA
Black	NA	NA	NA	NA	NA	NA	NA	NA
Hispanic	NA	NA	NA	NA	NA	NA	NA	NA
Mixed	NA	NA	NA	NA	NA	NA	NA	NA
1987–88								
White	8.4	14.4	72.4	4.8	44.6	4.0	50.8	0.8
Black	91.3	5.2	2.8	0.7	53.2	1.0	45.3	0.7
Hispanic	3.1	91.9	4.3	0.9	31.6	25.3	42.0	1.1
Mixed	29.5	30.3	37.0	3.0	45.0	18.0	37.2	0.0
Middle								
1988–89								
White	—	—	—	—	—	—	—	—
Black	90.8	8.0	1.1	0.6	65.8	3.4	28.6	2.2
Hispanic	9.5	81.4	7.9	1.8	45.5	9.1	45.0	0.4
Mixed	36.7	34.7	22.3	6.3	43.3	3.7	52.7	0.7
1989–90								
White	—	—	—	—	—	—	—	—
Black	90.1	8.7	1.1	0.9	68.9	2.2	27.1	2.0
Hispanic	9.0	82.6	7.0	1.9	46.0	9.4	44.3	0.5
Mixed	34.3	39.7	21.3	5.3	44.0	3.7	52.7	0.0
1990–91								
White	—	—	—	—	—	—	—	—
Black	90.2	8.3	1.3	0.7	72.1	2.4	24.1	1.6
Hispanic	8.3	84.9	5.9	1.6	41.4	10.5	47.1	1.0
Mixed	34.3	41.3	20.0	5.0	40.7	3.3	55.3	0.7

At the elementary level, there is a greater disparity among school types based on mobility rate and socioeconomic status, as measured by the percent of students participating in the federally funded free and reduced lunch program. (See Table 3.) The disparity among the middle schools is smaller. It is not unexpected that the majority White elementary schools had a much lower percentage of students eligible for the free and reduced lunch program than did the majority Black or Hispanic schools. The mixed schools had the next lowest percent. This pattern was true for the middle schools as well.

Table 3.
Other Characteristics of the Schools Used in the Sample

Elementary	Percent Free/ Reduced Lunch	Attendance Rate	Mobility Rate
1986–87			
White	NA	95.7	25.0
Black	NA	95.0	36.0
Hispanic	NA	95.6	37.0
Mixed	NA	95.0	48.5
1987–88			
White	13.6	95.8	21.8
Black	83.8	95.9	37.3
Hispanic	87.0	95.9	32.4
Mixed	50.8	95.2	47.3
Middle			
1988–89			
White	—	—	—
Black	56.4	91.0	45.6
Hispanic	65.5	91.6	40.5
Mixed	45.3	92.3	50.8
1989–90			
White	—	—	—
Black	53.6	90.0	44.3
Hispanic	64.9	91.1	35.9
Mixed	45.0	91.8	43.7
1990–91			
White	—	—	—
Black	51.3	88.8	54.0
Hispanic	63.0	89.8	43.8
Mixed	49.0	90.3	56.0

As predicted, the standard achievement test scores were higher for the majority White elementary schools than for the other schools, followed by the mixed schools. (See Table 4.) As there were no majority White middle schools, this trend cannot be verified though it would be expected based on the literature. It is interesting that the average grade equivalent scores on the MAT-6 were above grade level (at the eighth month when the test was administered) for the elementary years with the exception of the majority Black and Hispanic schools reading scores. In comparison, only the math scores for the students at the mixed schools during the sixth grade were at grade level.

Table 4.
Reading and Math MAT-6 Scores for the Schools Used in the Sample

Elementary	MAT-6 Grade Equivalent Scores Reading	Math	*Middle*	MAT-6 Grade Equivalent Scores Reading	Math
1986–87	**4th Grade**		**1988–89**	**6th Grade**	
White	7.0	6.8	White	—	—
Black	4.1	5.1	Black	5.0	5.9
Hispanic	3.8	5.1	Hispanic	5.4	6.6
Mixed	5.6	5.8	Mixed	5.7	6.8
1987–88	**5th Grade**		**1989–90**	**7th Grade**	
White	7.6	8.0	White	—	—
Black	5.3	6.3	Black	5.7	6.4
Hispanic	4.9	6.3	Hispanic	5.9	6.6
Mixed	6.4	7.4	Mixed	6.6	7.1
			1990–91	**8th Grade**	
			White	—	—
			Black	6.6	7.0
			Hispanic	6.8	7.6
			Mixed	7.9	7.8

Demographics of the Sample

The above section describes the schools attended by the students in the sample. However, it should be remembered that the schools are not the units of analysis. Many studies have been done determining whether or not White schools do better than Black schools or Hispanic schools. The purpose of this study is to determine how students of different ethnicities perform academically at the different types of schools. Before we answer this question, it is important to describe the demographic characteristics of the students who were in the sample. Tables 5 and 6 are breakdown tables for students by ethnicity and gender within school type along with socioeconomic status. One anomaly in the samples is that there are almost as many Hispanics as there are Blacks at the middle school level's majority Black schools. This is because eighth graders were initially chosen to create the database and then traced back to third grade. However, the elementary schools were chosen based on percent of ethnicity. Students at those schools were then traced forward to their respective middle schools, creating the high number in this cell.

Table 5.
Demographics of the Elementary School Student Sample

Elementary Schools	White Students		Black Students		Hispanic Students	
	Male	Female	Male	Female	Male	Female
Majority White						
Free/reduced lunch	2	—	5	6	9	5
No free/reduced lunch	70	70	6	11	7	5
Majority Black						
Free/reduced lunch	3	2	89	119	4	4
No free/reduced lunch	—	—	26	36	2	3
Majority Hispanic						
Free/reduced lunch	5	3	4	3	166	175
No free/reduced lunch	3	5	2	4	37	40
Mixed						
Free/reduced lunch	7	12	20	17	20	23
No free/reduced lunch	39	65	21	21	22	24

Table 6.
Demographics of the Middle School Student Sample

Middle Schools	White Students		Black Students		Hispanic Students	
	Male	Female	Male	Female	Male	Female
Majority White						
Free/reduced lunch	—	—	—	—	—	—
No free/reduced lunch	—	—	—	—	—	—
Majority Black						
Free/reduced lunch	2	3	34	30	33	40
No free/reduced lunch	6	11	36	47	40	28
Majority Hispanic						
Free/reduced lunch	2	1	4	3	46	37
No free/reduced lunch	5	3	2	2	45	42
Mixed						
Free/reduced lunch	3	3	6	8	1	3
No free/reduced lunch	11	13	8	7	8	14

Group Comparisons

With thirty tables indicating analysis of variance by grade, ethnic group, and subject, and with three to six group-to-group comparisons within each of these, trying to decipher and discuss the specifics of each one would be tedious for the reader. Therefore, a few broad statements regarding the general findings should suffice. When looking at the following tables, it should be helpful to focus on the specific comparisons and the group means. As with previous studies, we found that the higher the percent of White students in a school, generally, the higher the achievement of all ethnic groups. Specifically, the White students in the sample had higher means at predominantly White elementary schools and mixed middle schools. There were no predominantly White middle schools in the sample. With an exception in both reading and math at the seventh grade, Black students performed better at mixed elementary and middle schools. The same held true for Hispanic students with exceptions on the math subtest in 4th grade and 8th grade.

These results confirm previous research that indicates that the achievement of Black and Hispanic students is positively affected by a higher percent of White students in the school. However, White students are adversely affected by being in schools which are predominantly Black or Hispanic. In general, these findings hold true for both mathematics and reading. As mentioned earlier, although some small sample sizes were not included in the analysis, some were because their mean and standard error did not appear to be abnormal. These were provided for those who may be interested in those particular groups. However, inferences from results from these comparisons should be done with caution.

Table 7. ANOVA: White 4th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	6315.307	2	3157.653	11.57	.0001
Within groups	71233.144	261	272.924		
Total	77548.45	263			

Group	Count	Mean	Std. Dev.	Std. Error
White schools	135	76.829	15.675	1.349
Hispanic schools	14	57.386	14.745	3.941
Mixed schools	115	70.163	17.642	1.645

Comparisons	Mean Difference	Scheffe F-test
White schools vs. Hispanic schools	19.443	8.785*
White schools vs. Mixed schools	6.666	5.056*
Hispanic schools vs. Mixed schools	-12.777	3.733*

* Significant at $\alpha = .05$

Table 8. ANOVA: Black 4th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	3058.097	3	1019.366	3.06	.0284
Within groups	112274.325	337	333.158		
Total	115332.423	340			

Group	Count	Mean	Std. Dev.	Std. Error
White schools	24	52.087	13.754	2.808
Black schools	239	54.669	18.57	1.201
Hispanic schools	8	56.737	18.841	6.661
Mixed schools	70	61.686	18.401	2.199

Comparisons	Mean Difference	Scheffe F-test
White schools vs. Black schools	-2.581	.145
White schools vs. Hispanic schools	-4.65	.13
White schools vs. Mixed schools	-9.598	1.647
Black schools vs. Hispanic schools	-2.069	.033
Black schools vs. Mixed schools	-7.017	2.667*
Hispanic schools vs. Mixed schools	-4.948	.176

* Significant at $\alpha = .05$

Table 9. ANOVA: Hispanic 4th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	4012.665	3	1337.555	5.365	.0012
Within groups	115177.698	462	249.302		
Total	119190.362	465			

Group	Count	Mean	Std. Dev.	Std. Error
White schools	22	54.523	20.326	4.334
Black schools	9	67.467	23.885	7.962
Hispanic schools	363	56.307	14.61	.767
Mixed schools	72	63.282	18.639	2.197

Comparisons	Mean Difference	Scheffe F-test
White schools vs. Black schools	-12.944	1.431
White schools vs. Hispanic schools	-1.784	.088
White schools vs. Mixed schools	-8.759	1.729
Black schools vs. Hispanic schools	11.16	1.462
Black schools vs. Mixed schools	4.185	.187
Hispanic schools vs. Mixed schools	-6.975	3.908*

* Significant at $\alpha = .05$

Table 10. ANOVA: White 5th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	2446.767	2	1223.384	3.951	.0204
Within groups	80188.823	259	309.609		
Total	82635.59	261			

Group	Count	Mean	Std. Dev.	Std. Error
White schools	137	72.611	17.443	1.49
Hispanic schools	14	58.764	18.337	4.901
Mixed schools	111	71.75	17.694	1.679

Comparisons	Mean Difference	Scheffe F-test
White schools vs. Hispanic schools	13.847	3.933*
White schools vs. Mixed schools	.861	.073
Hispanic schools vs. Mixed schools	-12.985	3.385*

* Significant at $\alpha = .05$

Table 11. ANOVA: Black 5th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	3008.48	3	1002.827	3.19	.0239
Within groups	101210.216	322	314.317		
Total	104218.696	325			

Group	Count	Mean	Std. Dev.	Std. Error
White schools	25	54.576	12.534	2.507
Black schools	224	55.897	18.029	1.205
Hispanic schools	11	52.309	12.595	3.798
Mixed schools	66	62.968	18.959	2.334

Comparisons	Mean Difference	Scheffe F-test
White schools vs. Black schools	-1.321	.042
White schools vs. Hispanic schools	2.267	.042
White schools vs. Mixed schools	-8.392	1.354
Black schools vs. Hispanic schools	3.588	.143
Black schools vs. Mixed schools	-7.071	2.703*
Hispanic schools vs. Mixed schools	-10.659	1.136

* Significant at $\alpha = .05$

Table 12. ANOVA: Hispanic 5th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	2432.688	3	810.896	2.862	.0365
Within groups	132036.014	466	283.339		
Total	134468.702	469			

Group	Count	Mean	Std. Dev.	Std. Error
White schools	24	53.625	17.887	3.651
Black schools	8	60.438	20.205	7.144
Hispanic schools	365	57.2	16.115	.843
Mixed schools	73	62.816	19.471	2.279

Comparisons	Mean Difference	Scheffe F-test
White schools vs. Black schools	-6.812	.328
White schools vs. Hispanic schools	-3.575	.339
White schools vs. Mixed schools	-9.191	1.795
Black schools vs. Hispanic schools	3.238	.097
Black schools vs. Mixed schools	-2.379	.048
Hispanic schools vs. Mixed schools	-5.617	2.258

Table 13. ANOVA: White 6th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	3175.177	2	1587.588	6.231	.0037
Within groups	13502.939	53	254.772		
Total	16678.116	55			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	18	49.028	13.077	3.082
Hispanic schools	9	61.878	17.988	5.996
Mixed schools	29	65.81	16.911	3.14

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	-12.85	1.944
Black schools vs. Mixed schools	-16.783	6.139*
Hispanic schools vs. Mixed schools	-3.933	.208

* Significant at $\alpha = .05$

Table 14. ANOVA: Black 6th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	127.914	2	63.957	.257	.7739
Within groups	35624.626	143	249.123		
Total	35752.54	145			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	120	47.61	16.012	1.462
Hispanic schools	7	44.114	15.734	5.947
Mixed schools	19	49.105	14.201	3.258

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	3.496	.162
Black schools vs. Mixed schools	-1.495	.074
Hispanic schools vs. Mixed schools	-4.991	.256

Table 15. ANOVA: Hispanic 6th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	671.866	2	335.933	1.293	.2759
Within groups	75583.374	291	259.737		
Total	76255.24	293			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	119	48.386	14.443	1.324
Hispanic schools	154	51.105	17.305	1.394
Mixed schools	21	52.919	16.049	3.502

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	-2.719	.956
Black schools vs. Mixed schools	-4.533	.706
Hispanic schools vs. Mixed schools	-1.814	.117

Table 16. ANOVA: White 7th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	4359.662	2	2179.831	10.342	.0002
Within groups	10538.625	50	210.773		
Total	14898.288	52			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	19	41.626	12.439	2.854
Hispanic schools	7	58.914	15.053	5.69
Mixed schools	27	60.9	15.682	3.018

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	-17.288	3.627*
Black schools vs. Mixed schools	-19.274	9.828*
Hispanic schools vs. Mixed schools	-1.986	.052

* Significant at $\alpha = .05$

Table 17. ANOVA: Black 7th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	186.13	2	93.065	.528	.5911
Within groups	25397.103	144	176.369		
Total	25583.233	146			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	119	42.68	12.998	1.192
Hispanic schools	7	47.314	19.875	7.512
Mixed schools	21	41.371	12.432	2.713

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	-4.634	.403
Black schools vs. Mixed schools	1.308	.087
Hispanic schools vs. Mixed schools	5.943	.526

Table 18. ANOVA: Hispanic 7th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	1811.567	2	905.783	3.847	.0224
Within groups	68037.868	289	235.425		
Total	69849.434	291			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	121	43.157	13.204	1.2
Hispanic schools	152	47.626	16.193	1.313
Mixed schools	19	50.768	20.441	4.689

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	-4.469	2.857
Black schools vs. Mixed schools	-7.611	2.02
Hispanic schools vs. Mixed schools	-3.143	.354

Table 19. ANOVA: White 8th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	4417.263	2	2208.632	8.957	.0004
Within groups	13316.138	54	246.595		
Total	17733.401	56			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	18	39.55	11.613	2.737
Hispanic schools	10	55.85	19.107	6.042
Mixed schools	29	59.162	16.624	3.087

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	-16.3	3.463*
Black schools vs. Mixed schools	-19.612	8.662*
Hispanic schools vs. Mixed schools	-3.312	.165

* Significant at $\alpha = .05$

Table 20. ANOVA: Black 8th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	676.252	2	338.126	1.548	.2161
Within groups	33647.012	154	218.487		
Total	34323.264	156			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	125	38.493	13.798	1.234
Hispanic schools	10	43.78	23.395	7.398
Mixed schools	22	43.582	15.607	3.327

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	-5.287	.592
Black schools vs. Mixed schools	-5.089	1.109
Hispanic schools vs. Mixed schools	.198	.001

Table 21. ANOVA: Hispanic 8th Graders, Math

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	811.961	2	405.98	1.974	.1407
Within groups	59221.674	288	205.631		
Total	60033.634	290			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	121	41.582	11.63	1.057
Hispanic schools	151	45.045	15.817	1.287
Mixed schools	19	44.1	17.424	3.997

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	-3.463	1.959
Black schools vs. Mixed schools	-2.518	.253
Hispanic schools vs. Mixed schools	.945	.037

Group Comparison Tables for Reading

Table 22. ANOVA: White 4th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	4046.255	2	2023.127	8.265	.0003
Within groups	63155.745	258	244.79		
Total	67202	260			

Group	Count	Mean	Std. Dev.	Std. Error
White schools	135	70.218	14.679	1.263
Hispanic schools	12	52.65	10.995	3.174
Mixed schools	114	65.614	17.077	1.599

Comparisons	Mean Difference	Scheffe F-test
White schools vs. Hispanic schools	17.568	6.947*
White schools vs. Mixed schools	4.604	2.676
Hispanic schools vs. Mixed schools	-12.964	3.727*

* Significant at $\alpha = .05$

Table 23. ANOVA: Black 4th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	4190.192	2	2095.096	8.9	.0002
Within groups	77445.211	329	235.396		
Total	81635.402	331			

Group	Count	Mean	Std. Dev.	Std. Error
White schools	24	50.946	14.261	2.911
Black schools	239	47.494	14.73	.953
Mixed schools	69	56.288	17.628	2.122

Comparisons	Mean Difference	Scheffe F-test
White schools vs. Black schools	3.452	.552
White schools vs. Mixed schools	-5.343	1.08
Black schools vs. Mixed schools	-8.795	8.796*

* Significant at $\alpha = .05$

Table 24. ANOVA: Hispanic 4th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	6748.891	3	2249.63	11.698	.0001
Within groups	72309.927	376	192.314		
Total	79058.818	379			

Group	Count	Mean	Std. Dev.	Std. Error
White schools	21	52.162	16.165	3.528
Black schools	9	55.211	12.045	4.015
Hispanic schools	278	45.233	13.182	.791
Mixed schools	72	55.276	15.829	1.865

Comparisons	Mean Difference	Scheffe F-test
White schools vs. Black schools	-3.049	.102
White schools vs. Hispanic schools	6.928	1.625
White schools vs. Mixed schools	-3.114	.273
Black schools vs. Hispanic schools	9.978	1.504
Black schools vs. Mixed schools	-.065	.00005909
Hispanic schools vs. Mixed schools	-10.043	9.998*

* Significant at $\alpha = .05$

Table 25. ANOVA: White 5th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	5236.674	2	2618.337	10.843	.0001
Within groups	62786.267	260	241.486		
Total	68022.941	262			

Group	Count	Mean	Std. Dev.	Std. Error
White schools	137	71.568	14.594	1.247
Hispanic schools	15	52.893	13.401	3.46
Mixed schools	111	66.873	16.87	1.601

Comparisons	Mean Difference	Scheffe F-test
White schools vs. Hispanic schools	18.675	9.762*
White schools vs. Mixed schools	4.695	2.798
Hispanic schools vs. Mixed schools	-13.98	5.347*

* Significant at $\alpha = .05$

Table 26. ANOVA: Black 5th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	7012.105	3	2337.368	10.462	.0001
Within groups	72165.504	323	223.423		
Total	79177.609	326			

Group	Count	Mean	Std. Dev.	Std. Error
White schools	25	52.6	12.486	2.497
Black schools	226	48.96	14.1	.938
Hispanic schools	10	40.9	12.734	4.027
Mixed schools	66	59.7	18.493	2.276

Comparisons	Mean Difference	Scheffe F-test
White schools vs. Black schools	3.64	.445
White schools vs. Hispanic schools	11.7	1.459
White schools vs. Mixed schools	-7.1	1.364
Black schools vs. Hispanic schools	8.06	.928
Black schools vs. Mixed schools	-10.74	8.791*
Hispanic schools vs. Mixed schools	-18.8	4.579*

* Significant at $\alpha = .05$

Table 27. ANOVA: Hispanic 5th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	6100.51	3	2033.503	8.687	.0001
Within groups	110728.159	473	234.098		
Total	116828.669	476			

Group	Count	Mean	Std. Dev.	Std. Error
White schools	24	46.575	15.138	3.09
Black schools	9	52.311	10.83	3.61
Hispanic schools	370	45.369	14.683	.763
Mixed schools	74	55.104	18.495	2.15

Comparisons	Mean Difference	Scheffe F-test
White schools vs. Black schools	-5.736	.307
White schools vs. Hispanic schools	1.206	.047
White schools vs. Mixed schools	-8.529	1.877
Black schools vs. Hispanic schools	6.942	.603
Black schools vs. Mixed schools	-2.793	.089
Hispanic schools vs. Mixed schools	-9.735	8.322*

* Significant at $\alpha = .05$

Table 28. ANOVA: White 6th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	824.562	2	412.281	2.301	.1103
Within groups	9317.704	52	179.187		
Total	10142.265	54			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	17	51.741	10.169	2.466
Hispanic schools	9	59.378	12.886	4.295
Mixed schools	29	60.31	15.041	2.793

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	-7.637	.958
Black schools vs. Mixed schools	-8.569	2.196
Hispanic schools vs. Mixed schools	-.933	.017

Table 29. ANOVA: Black 6th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	.861	1	.861	.004	.9492
Within groups	29351.333	139	211.161		
Total	29352.194	140			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	120	44.843	14.409	1.315
Mixed schools	21	44.624	15.239	3.325

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Mixed schools	.22	.004

Table 30. ANOVA: Hispanic 6th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	222.126	2	111.063	.671	.5122
Within groups	48863.359	295	165.639		
Total	49085.486	297			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	121	41.393	12.048	1.095
Hispanic schools	157	42.376	13.561	1.082
Mixed schools	20	44.84	12.05	2.694

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	-.983	.199
Black schools vs. Mixed schools	-3.447	.616
Hispanic schools vs. Mixed schools	-2.464	.325

Table 31. ANOVA: White 7th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	1467.011	2	733.506	3.373	.0422
Within groups	10871.833	50	217.437		
Total	12338.845	52			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	19	48.689	15.948	3.659
Hispanic schools	7	63.286	10.173	3.845
Mixed schools	27	57.956	14.771	2.843

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	-14.596	2.506
Black schools vs. Mixed schools	-9.266	2.202
Hispanic schools vs. Mixed schools	5.33	.363

Table 32. ANOVA: Black 7th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	31.982	1	31.982	.146	.7027
Within groups	30612.992	140	218.664		
Total	30644.975	141			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	120	42.553	14.453	1.319
Mixed schools	22	41.241	16.557	3.53

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Mixed schools	1.312	.146

Table 33. ANOVA: Hispanic 7th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	496.294	2	248.147	1.229	.2942
Within groups	57960.411	287	201.953		
Total	58456.705	289			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	119	41.542	12.672	1.162
Hispanic schools	152	39.98	15.376	1.247
Mixed schools	19	45	13.563	3.112

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	1.562	.403
Black schools vs. Mixed schools	-3.458	.485
Hispanic schools vs. Mixed schools	-5.02	1.054

Table 34. ANOVA: White 8th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	672.431	2	336.216	1.081	.3464
Within groups	16793.591	54	310.992		
Total	17466.022	56			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	18	52.072	16.328	3.849
Hispanic schools	10	55.75	23.969	7.58
Mixed schools	29	59.797	15.914	2.955

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	-3.678	.14
Black schools vs. Mixed schools	-7.724	1.065
Hispanic schools vs. Mixed schools	-4.047	.196

Table 35. ANOVA: Black 8th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	843.356	1	843.356	3.717	.0558
Within groups	32901.003	145	226.903		
Total	33744.359	146			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	125	42.431	14.932	1.336
Mixed schools	22	49.145	15.816	3.372

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Mixed schools	-6.714	3.717

Table 36. ANOVA: Hispanic 8th Graders, Reading

Source	Sum of Squares	*df*	Mean Square	F	*p*
Between groups	377.155	2	188.578	.898	.4086
Within groups	60286.984	287	210.059		
Total	60664.139	289			

Group	Count	Mean	Std. Dev.	Std. Error
Black schools	116	40.574	12.666	1.176
Hispanic schools	153	42.618	15.438	1.248
Mixed schools	21	44.019	16.753	3.656

Comparisons	Mean Difference	Scheffe F-test
Black schools vs. Hispanic schools	-2.044	.656
Black schools vs. Mixed schools	-3.445	.502
Hispanic schools vs. Mixed schools	-1.401	.086

Discussion

The results of this study provide evidence that it may be more academically beneficial to minority students for school districts to place an emphasis on desegregating schools rather than promoting single-race schools. We know that many schools are physically segregated. Previous work has shown that different ethnic groups are segregated within the same school. This has been a slight variation on that work: groups within the same ethnic group are academically segregated because they are in different schools.

Why are there differences? There are a number of possibilities: (1) Socioeconomic status, (2) Something inherent in the different school types (e.g., minority schools have less financial resources or poor management, etc.), (3) Something inherent in the school or culture, e.g., perhaps there is the lack of neighborhood role models for students who are minority within a school, or perhaps Hispanic students do poorer in a White school because of the language and culture.

An investigation of the following, (1) effects of socioeconomic status, and (2) the effects of school-type over time, comprise the next logical steps for this study. The effects of SES are discussed below. Another step to follow this study should be tracing the students into the next years of their schooling. Of course the intent will be to match elementary, middle, and senior high schools on the percent of ethnicity and to follow students who continue in the same type of school. It will be interesting to discover if the results continue into the following schools.

The primary physical limitation of our study has been the low number in some of the samples; this was due to our selection process. This created two gaps in the study: (1) a few of the group comparisons were not available, and (2) in any future investigation using these samples, we will not be able to track all of these groups over time. However, it should be noted that there is a trade-off here. Although we lost some comparisons and the ability to track some groups, this study used a criterion of 75% (and over) to select predominantly one-ethnicity/race schools. Some of the previous studies used either a lower criterion number of 40% (Lee & Bryk, 1989) or a correlation between percent of ethnicity and achievement (no matter what the percent of ethnicity

was) to infer the effect of percent of ethnicity on achievement. Forty percent is not a majority; most of our schools were eighty or ninety percent of the majority group; White majority schools comprised the exception. While we lost some comparisons, we were pursuing questions regarding schools comprised of predominantly one ethnicity/race. Setting a higher percent of ethnicity allowed us to do this. Another physical limitation was that there were no White majority middle schools. This, of course, was simply because none existed in the available population.

The intent of this study was to look only at differences in school type. A cursory analysis for confounding variables was conducted prior to analysis to use school selection to factor out such possibilities as socioeconomic status and the effect of specific schools. However, only the effect of specific schools could be factored out (e.g., students from magnet schools were not used). It was not possible, with the data set used here, to factor out the socioeconomic status from the percent of ethnicity within schools. In spite of appropriate sampling and adequately sensitive measures, confounding variables inherent to the data can still be problematic (McPartland & Karweit, 1979). The only way to separate SES from ethnicity would be to find some anomalies (e.g., an all Black school in an affluent area, affluent Hispanic students at an otherwise poor school, etc.). These were not available in the data set used here. But other studies have had similar difficulties: "Because many school-level factors were highly correlated, we could not independently assess the impact of school composition and resources" (Rumberger & Willms, 1992, p. 378). Not being able to separate socioeconomic status from ethnicity may very well be the crux of the matter.

Based on results of this study, it appears that segregation of ethnicities does not enhance academic achievement. We found much the same results as in previous studies. More variation in achievement occurs between students than between schools (McPartland & Karweit, 1979; Rumberger & Willms, 1992) and it may be that one is "more likely to monitor changes in the racial and ethnic achievement gap from year to year than to emphasize differences among schools or districts" (Rumberger & Willms, 1992, pp. 389 & 392). In spite of this, we know that there is still some variation between students that can be attributed to schools. As mentioned in the review

section, and as we have seen in this data set, all groups in schools with a larger proportion of White students or in mixed school settings perform better on academic tests. After the experience of evaluating programs within a large urban district, we feel that the role models, family structure, and parental involvement of the schools in the neighborhoods may be more important than the money that a school or a district spends. Perhaps these variables should be the concentrations of future research. And as Marx stated, it is not enough to simply describe the world; the point is to change it. Interventions, based on the investigations into these areas, may produce fruitful results. However, to answer our original question of whether it is academically beneficial to create single-ethnicity schools, it appears from this and many previous studies that it is not.

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